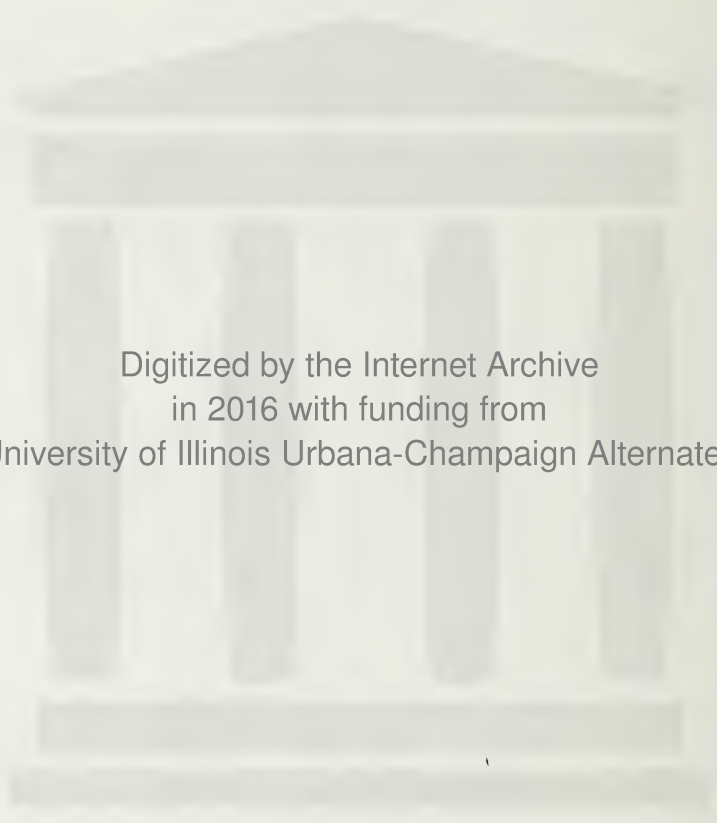


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Hairless Pigs

The Cause and Remedy

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PROPER TREATMENT PREVENTED HAIRLESS MALADY

This sow had previously produced a litter of dead and hairless pigs. (See Fig. 2) She was again fed on the same ration,—33 parts of corn, 33 parts of oats, and 33 of clover,—but when to this was added 10 grams of potassium iodide to each 100 pounds of feed she produced a normal litter.

AGRICULTURAL EXPERIMENT STATION
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DIGEST

An increasing number of hairless pigs is born annually in the hog belt. This malady has caused heavy losses in several states and has appeared in Wisconsin. Page 3.

Goiter is the cause of the hairless pig malady. The thyroid gland is enlarged and fails to work properly. The enlarged gland is not so noticeable in the sow as in the pigs. It does not affect the health of the sow, but does interfere with her powers of reproduction. Pages 3-6.

A small amount of iodine in the feed prevents hairless pigs. Ten grams of potassium iodide in 100 pounds of feed for the sow prevents recurrence. Pages 6-8.

It is impossible to tell whether or not a sow has goiter. Where hairless pigs are born one year it is safe to use the iodine remedy the next year. The malady occurs more often with spring pigs. Pages 7-9.

A proper ration may do much to prevent hairless pigs. Plenty of roughage—alfalfa and clover hay—helps. The Wisconsin outbreak in 1918 was probably due to feeding too much grain and too little roughage. Pages 9-10.

Feed a small amount of potassium iodide and increase the roughage for the breeding stock on farms where hairless pigs were born the past year. Pages 10-11.

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Hairless Pigs

The Cause and Remedy

Every spring on the farms of Wisconsin as well as in other sections of the "hog belt" there is born a considerable number of hairless pigs. Practically every county where swine raising is developed and from which we have had reports has had cases of this malady. It occurs in the northern as well as in the southern counties, and in the western as well as in the eastern part of this state.

In some other sections of our country, notably in Montana, the losses from hairless pigs have been enormous. It is estimated that from 100,000 to 1,000,000 are lost annually in that state alone from this cause, and it has become a serious menace to the swine industry in several states and to some of the swine breeders in our own state.

Hairless pigs are of normal weight and size, perhaps a little above normal weight; they are generally carried the full gestation period and often four to seven days over time. When absolutely hairless and born alive they may live a few hours after birth, but always die sooner or later. They are characterized by thick pulpy necks, thick skin, no squeal, and no vitality. Where perfectly hairless the skin is smooth, shiny, and bald, except for a few hairs around the eyes and nose. The hoofs of hairless pigs are thin-walled and undeveloped. In the same litter there may be variations from pigs with full-haired coats and full vigor to pigs with scanty-haired coats and little vitality. Those with some hair may live if given special attention and care.

Pigs in this condition are more likely to be born from gilts than from old sows. They are more likely to be born in the spring than in the fall.

GOITER IS THE CAUSE

The cause of this malady in both sow and young pig is goiter, an enlarged, improperly working thyroid gland. The thyroid gland, at the center and base of the throat in its enlarged

condition accounts for the thick necks of the little pigs. The sow is also suffering from an enlarged thyroid, but this cannot be so readily observed due to the large, fat, fleshy neck. (The goiter in the sow does not seriously affect her health and it does not affect her use for meat, but unless corrected it does interfere with her breeding functions.) The thyroid gland of a normal new-born pig is about the size of a pea, while that of a hairless pig is the size of a hickory nut. The gland in

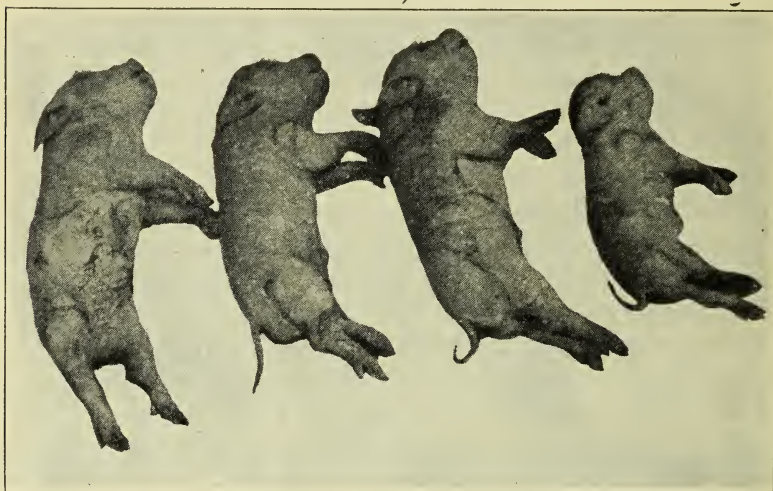


FIG. 1.—A GROUP OF HAIRLESS PIGS

Hairless pigs are dead pigs. The losses from the production of hairless pigs in Wisconsin have been considerable and most of them can be avoided.

a normal sow varies in size, but usually is not larger than a walnut, while in a sow producing hairless pigs it is the size of a man's fist.

Studies of goiter in the human race have shown that when the thyroid gland is removed or its function interfered with, as in goiter or in cancer of the thyroid, the hair and nails cease to develop and the skin of the face and neck becomes thick and pulpy. These conditions correspond very closely with those found in hairless pigs.

The immediate cause of goiter in the human race is not clearly established by medical science, but a cure for the simple form has been found in the use of iodine. It is surprising how widely prevalent goiter really is. It is estimated that

85 per cent of the dogs on the streets of Chicago show more or less enlargement of the thyroid; and goiter or "big neck" is being recognized more frequently in calves, lambs and colts. In the states of Oregon, Washington, and Montana considerable losses by big neck in colts, lambs, and calves have been reported and cases among lambs have been reported in our own state. At one time the sheep-raising industry of Michigan was in danger, because of goiter in lambs. Before the dis-



FIG. 2.—DEAD HAIRLESS PIGS

Note the thick necks indicating a goitrous condition. The mother of these pigs had been started on a grain ration—high protein and no roughage. On this ration she did not thrive well and was changed to one consisting of 15 parts of alfalfa, 25 of corn, 25 of oats, 25 of middlings, and 10 of oil meal, and kept under strict confinement. She had produced two litters of hairless pigs on this ration before being changed to the ration of 33 parts of clover, 33 of corn and 33 of oats on which she again produced hairless pigs. The picture on the cover shows how the trouble was corrected in this same sow by the use of potassium iodide.

covery of salt deposits around the Great Lakes its future seemed hopeless, but with the development of the salt industry and the use of salt by sheep growers goiter rapidly decreased. The salt contained appreciable quantities of iodine. At present the **refined** rock salts coming from Michigan, as well as from other parts of the United States, do not contain enough iodine to make their use a guarantee of goiter prevention.

Marine, a few years ago, found goiter prevalent among brook trout artificially reared in hatcheries, while those in the free runs outside of the ponds did not have this trouble. He was able to prevent the disease in several hatcheries by the use of very small amounts of tincture of iodine added to the water.

USE OF IODINE PREVENTS HAIRLESS CONDITION

The fact that hairless pigs are the product of a mother suffering from goiter suggested the possibility of curing and



FIG. 3.—A MIXED LITTER OF HAired AND HAIRLESS PIGS

A sow may produce a litter in which there are both haired and hairless pigs. The hairless ones are dead, while those with hair will show life and may be raised. This sow grew up on a ration of 30 parts of corn, 30 of oats, 30 of middlings, 8 of oil meal and 1 of tankage. She was under strictly confined conditions, but appeared normal in every other respect, excepting in reproduction.

controlling this malady with iodine. The thyroid gland forms a chemical substance containing iodine which it circulates through the blood stream. This compound is of the greatest importance to the proper development of an animal. When conditions arise requiring more of this compound, and the iodine supply in the food is not increased, the gland enlarges to let more blood pass through it in a given time. It is, therefore, either a failure to absorb the iodine from the feed or a failure of the thyroid gland to absorb the iodine that is in the blood that causes goiter.

The thyroid gland of the hairless pig contains no iodine; a normal thyroid in its dried state contains about .2 per cent of iodine. The iodine supply in our feeding materials is comparatively low and this is true for all feeding materials. However, in most instances there is enough iodine present in our feeds when it is *properly assimilated*; but under certain con-



FIG. 4.—ANOTHER CORRECTION WITH POTASSIUM IODIDE

The same sow as shown in Figure 3 and on the same ration, but to which was added 10 grams of potassium iodide to each 100 pounds of feed. All the young were born alive and in normal condition.

ditions of life, the exact analysis of which is not possible in the present state of our knowledge, our farm animals are unable to absorb sufficient amounts of iodine.

HOW TO USE IODINE

We have successfully corrected the hairless pig trouble by giving the sow during her entire gestation period 10 grams (approximately $\frac{1}{3}$ of an ounce) of potassium iodide per 100 pounds of feed. This material can be procured from almost any drug store. It should be powdered to a meal as fine as flour, and then mixed with 100 pounds of feed.

There is no way, so far as we know, of telling beforehand whether or not a sow has goiter. But where hairless pigs have occurred on the farm it would be good insurance against their reoccurrence to use potassium iodide. At the present prices for this chemical a sow can be carried through the entire gestation period for about 25 cents. Special quack

remedies should be avoided; nothing but iodine will do the work and the products of venders of special drugs should be avoided. **This malady is not abortion, but is due to the poor working of the thyroid gland.**

Tests of this treatment at the Montana Experiment Station have shown that about half of the amount of potassium iodide we have used, when fed for 60 days, will prevent hairless pig production. We have not as yet had an opportunity to try the smaller dose, but would recommend that from 5 to 10 grams of potassium iodide ($\frac{1}{3}$ to $\frac{1}{6}$ of an ounce) per 100 pounds of feed be used. Do not use more as it would be unnecessary and a waste of money. It had better be fed the entire gestation period, or at least the last 75 days of gestation, until further experiments have decided whether a shorter period of use would be equally efficient.

VARIATIONS IN THE MALADY

This malady is subject to the greatest variations. Four sows in the same pen and fed the same ration and cared for in identically the same way may give the following results: two will come through with sound, normal litters; the third will give a mixed litter, that is, some with a good hair coat and some with scanty hair coat, or absolutely hairless; the fourth will give all hairless pigs. We believe these results are probably due to constitutional differences in the animals, inherent factors which always display themselves with any group of animals. A ration that is near the border line of deficiency in iodine and at the same time is slightly out of balance in some other respect may well affect some individuals more than others.

Again, a farmer may lose 90 per cent of his spring pigs by this malady and yet that same breeding stock may produce under summer conditions, such as pasture and exercise, good litters in the fall. It is such conditions as summer pasture and exercise that are important factors in preventing this malady without the use of potassium iodide.

PROPER REARING MAY PREVENT HAIRLESS PIGS

We have reared a considerable number of sows on rations made partly of grains, but with 25 per cent of alfalfa in the ration and under these conditions have never had a case of hairless pigs. They were even confined in pens while on these rations. But when our young stock was started at weaning

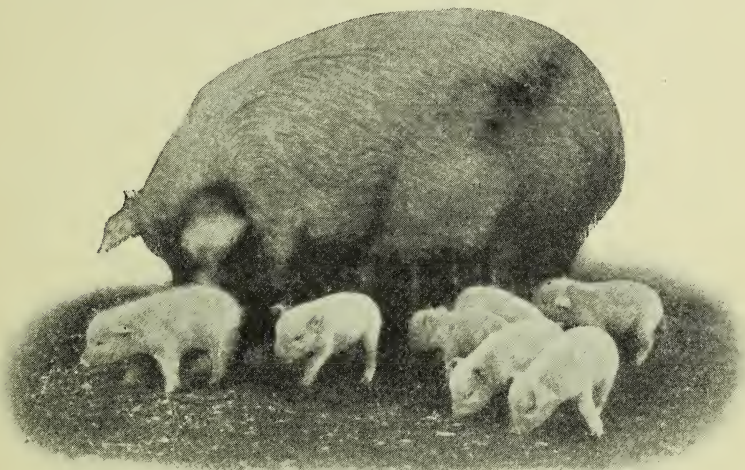


FIG. 5.—RAISING THE GILT SO AS TO HELP IN THE PREVENTION OF HAIRLESS PIGS

We believe that hairless pig production is often the result of improper feeding of young sows, such as giving them too high protein feeds and too little roughage in the ration. This sow was reared on a ration of 75 parts of corn and 25 of alfalfa. While the sows may grow at a somewhat slower rate than normal, yet the litters have always been haired and strong where sows have been reared on rations containing 15 to 25 per cent of roughage.

time on concentrates such as grains and skimmilk, and little or no roughage was used in the ration, hairless pigs often resulted; and there was just as much iodine in one ration as in the other.

Alfalfa or clover hay should form 25 per cent of the ration. If choice, leafy hay is fed in a rack, sows will (usually) eat this proportion of hay. However, if they do not eat enough of the uncut hay to make about 25 per cent of the ration, the hay may be cut and mixed with the other feed.

An extraordinary outbreak of hairless pigs occurred in the spring of 1917 in areas in Montana not previously affected.

There had been a cold, long winter, roughage was scarce, and the animals were wintered mainly on grains. In the spring of 1918, after a mild winter, with practically no snow, and plenty of hay, there were almost no cases of hairless pigs in the "unaffected" areas.

In Wisconsin, the spring of 1918 saw some of our breeders experiencing this malady for the first time. The winter had been extremely severe and roughages were scarce among those suffering most. Our experience indicates that the liberal use of roughage and the feeding of rations not excessively high in protein are by far the safest rules to follow in the rearing of gilts for breeding purposes, if the too common occurrence of hairless pigs is to be prevented. Farmers should not rely wholly on grains and skimmilk for their breeding gilts. Introduce 25 per cent of the ration as cut alfalfa or clover. This gives bulk to the ration and insures proper elimination of waste through the intestines; it keeps the intestines in a healthy condition and will allow the absorption of sufficient amounts of iodine naturally present in the feed to meet the sow's needs without the use of potassium iodide. Keep the animals dry and provide exercise. Goiter is more prevalent in northern, mountainous districts with cold, long, damp winters and little sunshine, than in the warm climates with plenty of sunshine and opportunity for exercise.

The suggested method of rearing breeding swine may not always prevent goiter—some cases will need the potassium iodide treatment—but we believe proper rearing will go a long way toward solving a growing difficulty in this state. However, if you had hairless pigs in the spring of 1918 it will be advisable to use the potassium iodide treatment this winter.

SUMMARY

Goiter, or an enlarged thyroid gland the function of which is disturbed, is the cause of hairless pigs. Both sow and young are afflicted with enlarged glands.

The enlarged glands are deficient in iodine, which is essential to the proper action of this gland and the production of normal young.

Iodine, supplied the female breeding stock during the gestation period, will prevent this trouble. One-third to one-sixth

of an ounce of potassium iodide to each 100 pounds of feed will prevent hairless pigs. Do not use more.

Rearing the breeding sows with plenty (25 per cent) of good roughage, such as alfalfa or clover hay, in the ration and not an excessive amount of protein may do much toward preventing this trouble and thus avoid the necessity for using the potassium iodide treatment later.





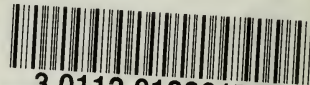
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